The Impact of Green Credit Policies on Corporate Environmental Responsibility Implementation and Mechanism Analysis: A Pre- and Post- Event Perspective

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Abstract

In recent years, high-quality economic development has become a core topic of widespread societal concern, with green credit policies exerting significant influence on corporate environmental responsibility fulfillment. This study employs data from A-share listed companies between 2008 and 2020 to construct a two-way fixed effects model, examining the impact of green credit policies on corporate environmental responsibility fulfillment and analyzing its underlying mechanisms. The benchmark regression reveals that the implementation of green credit policies positively promotes both pre-event and post-event environmental responsibility fulfillment among enterprises, with results passing robustness tests. Heterogeneity analysis indicates that green credit policies exert a more pronounced effect on environmental responsibility fulfillment in state-owned enterprises than in non-state-owned enterprises. Finally, the mechanism analysis reveals that green credit policies enhance both pre-event and post-event environmental responsibility levels by improving the quality of green credit supply. Therefore, it is imperative to refine the green credit system and strengthen management at the supply end. Enterprises should also proactively assume social environmental responsibilities and elevate their pre-event and post-event governance standards.

Keywords: green credit policies, environmental responsibility fulfillment, pre-event and post-event, green credit quality

1. Introduction

With countries experiencing rapid economic development these days, environmental stresses in the world have increased at a very fast speed. Climate change and resource consumption have been widely emphasized, and promoting green conversion and sustainable development has been an agreement from the global community. The United Nations in 2015 adopted the 2030 Agenda for Sustainable Development and clarified new Sustainable Development Goals in social, economic, and environmental dimensions. In 2020, China specifically issued "dual carbon" goals and raised green and low-carbon development as a national strategic initiative. Under such a background, countries from global regions have come to understand how important green development is and are unanimously dedicated to safeguarding global environmental safety.

As the globe's largest developing country and carbon emitter, China has been actively implementing policies to encourage green development concepts and expedite its economy's green conversion. The green credit policies, as a vital component of the green financial system, have experienced rapid evolution. In 2012, the China Banking Regulatory Commission issued the Green Credit Guidelines and explained banking institutions' green lending mandates as well as operating norms. By the end of 2023, domestic as well as foreign-currency outstanding amounts of green loans reached 30.08 trillion yuan, marking a year-on-year increase of 36.5%—26.4 percentage points higher than that of total loans. Further, expanding coverage of green credit has produced a positive impact on the construction of green as well as low-carbon-oriented industries such as renewable energy.

Environmental governance requires corporate engagement as well, and fulfillment of corporate environmental responsibility is a required component of sustainable development. Environmental pressures are increasing, and corporate environmental accountability is attracting broader public scrutiny. Investors and consumers are giving greater attention to corporate environmental performance and social responsibility as well (Hurley et al., 2014). According to 2022 Evaluation Report on Environmental Responsibility Disclosure by Chinese Listed Companies, environmental responsibility disclosure by Chinese companies has continued to develop steadily, as disclosure index has increased by 1.7% compared to that of

the previous year. However, there are companies which are weak in disclosure awareness, indicating that mechanisms of incentives and constraints in the contemporary environmental governance system have space for improvement.

Meanwhile, green credit policies are found to have a close link to corporate environmental responsibility fulfillment. The policies restrict credit for high-pollution enterprises by raising their borrowing costs, subjecting them to limitations. While, preferential credit supports are provided to environmental-friendly enterprises, causing larger environmental investments and technological advancements. According to data from China Banking and Insurance Regulatory Commission (CBIRC), as of 2022 year-end, 21 major domestic banks' green credit balance was 20.6 trillion yuan. This annualizes supports in savings of over 600 million tons of standard coal and carbon dioxide equivalent emissions reduction by over 1 billion tons, and active participation in construction of green projects and investments in all forms.

According to this background, in this piece, pre- and post-event environmental responsibility fulfillment of A-share listed enterprises during 2008-2020 is studied in terms of the impact of green credit policies. According to theoretical research, it conducts benchmark tests of regression analysis of the impact of green credit policies on pre- and post-event environmental responsibility fulfillment. Then, after replacing two dependent variables, i.e., pre- and post-event environmental responsibility fulfillment, robustness of results is verified. Then, in terms of heterogeneity, it studies the impact of green credit policy from a perspective of heterogeneity between independent and state-owned enterprises. Lastly, it selects quality of green credit supply as a mechanism variable so as to detect underlying mechanisms through which green credit policies have an impact on pre- and post-event environmental responsibility fulfillment.

This work has three fundamental innovations: First, while prior work predominantly argues in the broad context of green finance, this work only considers green credit policies themselves. With concentrated benchmark regression analysis, it verifies their contributions to enterprises' pre- and post-event environmental responsibility fulfillment. Secondly, corporate environmental responsibility fulfillment is calculated from pre- and post-event viewpoints in this work. Through such a plural approach, corporate environmental responsibility fulfillment is better described, and a subtler view of how green credit policies differentially contribute to enterprises' pre-event green investments and post-event controls over pollution is possible. Thirdly, based on green credit's supply side, this work discusses financial institutions' credit systems, such as banks', in its analysis. The research directly and effectively addresses green credit supply mechanisms' quality, hence better illuminating channels through which green credit policies exercise their impacts upon firms' pre- and post-event environmental responsibility fulfillment.

2. Literature Review

2.1 Research on Green Credit Policies

2.1.1 The Meaning and Measurement of Green Credit Policies

The rise and development of green finance stem from humanity's pursuit of a green civilization. Salazar (1998) proposed that green finance aims to achieve a balance between environmental protection and sustainable economic development, emphasizing the integration of environmental considerations into financial activities. With the continuous advancement of sustainable development concepts, the principles of green finance have become widely embraced and increasingly prioritized by more nations. The concept of green credit policies originates from green finance and is also referred to as sustainable finance or environmental finance. Zhang (2008) contends that China's green credit policies align with the "Equator Principles," which constrain and guide financial institutions' lending activities with environmental protection as their core objective. Today, green credit has become a significant trend in modern financial development, serving as a market-based mechanism to advance sustainable development (Liu, 2012).

Regarding measurement methods for green credit policies, some scholars primarily employ the difference-in-differences approach, analyzing policy effects before and after implementation by setting up "policy dummy variables." Li and Zhu (2021) used the 2007 Green Credit Guidelines as the policy node, constructed a dummy variable, and examined the policy's impact on financing costs for heavily polluting enterprises. Other researchers measure green credit through its scale. Weber (2016) systematically employs the proportion of green loans as an indicator to analyze impacts on industry green transformation. Additionally, Tian and Nie (2023) conducted a visual analysis using knowledge graphs to systematically organize factors and methods for evaluating green credit.

2.1.2 Economic and Environmental Effects of Green Credit Policies

Scholars generally agree that green finance can positively promote economic development. Shi and Shi (2022) demonstrated this view through a threshold model and found that when the level of green finance development exceeds the threshold value, the promotional effect significantly increases. Chen et al. (2023) systematically evaluated the economic impacts of green credit, concluding that it positively contributes to economic growth and ecological improvement by optimizing industrial structures and enhancing green total factor productivity. As a core instrument of green finance, green credit policies strengthen environmental pollution control and carbon emission management. Following the implementation of green credit policies, by restricting bank credit flows to "high-energy-consuming and high-polluting" enterprises or raising borrowing thresholds for such firms, the demand for energy conservation and emission reduction was stimulated. This led to a significant decline in sulfur dioxide emissions and industrial wastewater discharge in cities heavily impacted by the policies (Cai et al., 2019).

Focusing on smaller entities, enterprises as the basic units of production and operation, numerous scholars have also studied the impact of green credit policies on businesses. Green credit directly affects corporate financial health through differentiated financing costs. Ding (2019) employed a DID approach to empirically examine the strategic responses of heavily polluting enterprises to green credit policies. Results indicate that credit financing constraints imposed by such policies lead enterprises to passively reduce capital investment, with most heavily polluting firms exhibiting insufficient strategic adjustments in capital allocation efficiency. This also increases debt costs and significantly reduces operational performance for heavily polluting enterprises, clearly demonstrating that green credit carries significant financing penalty effects and investment suppression effects (Su and Lian, 2018). Simultaneously, green credit policies broaden financing channels for enterprises' green technological innovation, significantly promoting the enhancement of their green technological innovation levels and improving their intrinsic innovation capabilities (Zhao, 2021). He et al. (2019) employed a mediation model to demonstrate that green credit promotes technological innovation in environmental protection enterprises by increasing R&D investment. The stronger the financing constraints, the more pronounced the promotional effect of green credit on corporate technological innovation.

2.2 Research on the Implementation of Corporate Environmental Responsibility

2.2.1 The Meaning and Measurement of Corporate Environmental Responsibility Implementation

The concept of corporate social responsibility was first proposed by British scholar Sheldo (1924), who argued that while generating profits, enterprises should also shoulder social responsibilities toward communities, the environment, and other stakeholders. Corporate environmental responsibility represents an extension of CSR into the environmental domain, aiming to reduce resource consumption and pollution emissions through technological innovation and management optimization, thereby achieving a virtuous cycle of economic benefits and environmental protection. Freeman (1984) formally introduced the "stakeholder theory," asserting that enterprises must also consider the interests of groups such as government environmental agencies and residents affected by corporate pollution. Ismail (2009) provided a clearer articulation of corporate environmental responsibility, defining it as the adoption of ethical, socially responsible, and community-beneficial strategies in production, operations, and facility activities to mitigate adverse impacts on the ecological environment. Enterprises should increase environmental investments and emission reduction efforts, establish sound business ethics, and actively implement international environmental management standards to enhance their environmental responsibility fulfillment (Yang et al., 2019).

Methods for measuring corporate environmental responsibility primarily fall into two categories. The first involves single indicators, with some scholars using pollutant emission intensity or the proportion of environmental investments as measurement standards. Shen and Zhou (2018) selected pollutants like ammonia nitrogen, total nitrogen, and dust, along with industrial pollution control investment as a percentage of GDP, as explanatory variables. They analyzed the effectiveness of corporate environmental responsibility fulfillment based on changes in corporate environmental performance before and after environmental protection interviews. The second is a multidimensional evaluation system. Feng et al. (2014) combined content analysis with the analytic hierarchy process to determine indicator weights, thereby designing an evaluation system for corporate environmental information disclosure quality, offering additional avenues to understand corporate environmental responsibility fulfillment. He et al. (2014) developed an evaluation index system for corporate environmental responsibility based on a welfare-oriented social benefit function, using environmental cost internalization rates and environmental resource utilization efficiency as primary performance factors and evaluation indicators.

2.2.2 Factors Influencing the Implementation of Corporate Environmental Responsibility

Corporate environmental responsibility refers to the proactive commitment enterprises make to protect the ecological environment during their production and operations. Its influencing factors can be analyzed from both external and internal perspectives.

From an external standpoint, these factors primarily fall into two categories: environmental regulations and market dynamics. Regarding environmental regulations, the state implements a series of incentive policies to reduce the costs of corporate activities such as green technological innovation, thereby promoting environmental responsibility fulfillment (Xie et al., 2020). Conversely, environmental penalties are imposed on enterprises that fail to fully meet their environmental responsibilities, serving as a deterrent that compels companies to self-assess compliance and thereby enhances their environmental responsibility levels (Chen et al., 2021). Regarding market factors, Xie et al. (2024) indicate that growing demand for environmental sustainability among consumers and investors compels enterprises to enhance their environmental responsibility performance to safeguard reputation and secure resources, positively influencing their environmental responsibility fulfillment.

Regarding internal corporate factors, Clarkson et al. (2011) emphasize that the sophistication of internal environmental management systems is a critical determinant of responsibility fulfillment effectiveness. Enterprises with more robust management systems exhibit significantly lower pollutant emission intensities, thereby enhancing environmental performance. Concurrently, Cao and Chen (2017) contend that environmentally conscious executives demonstrate heightened sensitivity to corporate environmental responsibilities and market eco-demands. Such executives can identify potential benefits and market opportunities from green innovation, thereby advancing corporate green innovation strategies and exhibiting greater propensity to promote environmental responsibility fulfillment. Furthermore, enhancing environmental awareness among both the company and its employees, encouraging active participation in environmental management activities, and fostering a green culture can improve corporate environmental performance and drive the fulfillment of environmental responsibilities (Zheng et al., 2005).

2.3 Research on the Impact of Green Credit Policies on Corporate Environmental Responsibility Implementation

Green credit policies, as a vital component of the green financial system, exert a profound influence on enterprises' fulfillment of environmental responsibilities. Zhong et al. (2023) demonstrate through research that financial institutions in pilot regions employ financial leverage to internalize external pollution costs as corporate financing expenses via credit penalty mechanisms, thereby effectively incentivizing enterprises to assume environmental responsibilities. Zhang et al. (2023) utilized data from A-share listed companies on the Shanghai and Shenzhen stock exchanges from 2008 to 2021 to construct a difference-in-differences model. They found that the environmental pollution pressure exerted by green credit policies can promote the fulfillment of corporate environmental responsibilities. Simultaneously, green credit policies can also increase pressure for emission reduction and pollution control, thereby raising corporate environmental expenditures and enhancing green governance performance. Furthermore, green credit policies typically influence corporate environmental and social responsibility levels by reducing external constraints on financing channels and increasing corporate environmental awareness. The impact of green credit policies varies across firms with different characteristics. Firms located in regions with stricter environmental regulations and those with executives possessing higher educational backgrounds exhibit more pronounced effects from green credit policies (Si et al., 2021).

Past literature has offered limited research on the impact of green credit policies on corporate environmental responsibility fulfillment. As a key practice within green finance, most studies analyze the influence of green finance on corporate environmental responsibility fulfillment. Xiong and Ren (2024) found that green finance, by providing financial instruments such as green bonds, channels capital toward environmental projects. This drives urban green technological innovation, industrial structure upgrading, human capital aggregation, and optimized resource allocation, thereby positively influencing corporate environmental responsibility fulfillment. Fan (2021) proposed that establishing green finance reform and innovation zones enhances corporate technological innovation capabilities and incentivizes proactive environmental responsibility fulfillment. Simultaneously, due to the interplay between financial credit and environmental protection, corporate environmental information transmitted by governments to capital markets places greater pressure on high-emission enterprises, further elevating their environmental responsibility levels. Wang et al. (2024) suggest that enhanced media oversight plays a mediating role in this process. Within a green finance environment advocating green and sustainable development models, media disclosure of negative environmental information about high-polluting enterprises conveys adverse signals, compelling these firms to fulfill their environmental responsibilities. Liu and Wen (2019) demonstrate that under green finance, financial institutions constrain heavily polluting enterprises by optimizing resource allocation, thereby enhancing corporate environmental responsibility efficiency.

Low-carbon and green transitions represent concrete manifestations of corporate environmental responsibility fulfillment. Some scholars have also examined the impact of green credit policies on these transitions. Liu et al. (2024) found that green credit policies enhance total factor productivity through credit resource allocation, induce clean mergers and acquisitions, and reduce pollution and carbon emissions to some extent, thereby facilitating low-carbon transitions for high-polluting, energy-intensive enterprises. Hu (2023) posits that green credit, through three mechanisms—stimulating green power generation potential, advancing production technology, and greening output structures—not only drives the low-carbon transformation of the power generation industry but also promotes independent technological innovation within the sector. Unlike environmental policy tools such as mandatory emissions reductions and environmental taxes, green credit policies primarily internalize corporate environmental costs through financing channels. To enhance market competitiveness, enterprises must intensify innovation and transformation efforts. When combined with environmental remediation and environmental tax policies, green credit further encourages enterprises to develop green technologies and advance their green transformation (Xie and Zhang, 2020). Shu et al. (2022) found that green credit not only curbs the expansion of outdated production capacity in heavily polluting industries but also guides these enterprises toward green transformation. Green credit policies primarily function by expanding loan volumes to exert a "guiding effect" on corporate capital allocation. This encourages the development of clean projects or the greening of existing production processes, thereby facilitating corporate transformation toward low-consumption, low-emission, and low-pollution operations.

2.4 Literature Review

In recent years, green credit policies have garnered significant attention from scholars worldwide as a crucial financial tool for promoting corporate environmental responsibility, while the fulfillment of corporate environmental obligations has emerged as a key requirement for high-quality economic development. Regarding green credit, different scholars, based on varying measurement approaches, have primarily focused on its implementation effects on different entities through distinct transmission channels. Regarding corporate environmental responsibility, numerous scholars have provided clear definitions. The fulfillment of corporate environmental responsibilities is influenced by both external factors, such as government and market forces, and internal operational factors and mechanisms within the enterprises themselves. Furthermore, while a large number of scholars have focused on the impact of green finance on corporate green and low-carbon transformation, a smaller group has concentrated on green credit—a key component of green finance—and the fulfillment of corporate environmental responsibilities—a crucial manifestation of green and low-carbon transformation—to study the effects and mechanisms of green credit on corporate environmental responsibility fulfillment.

However, these studies exhibit certain limitations. First, research focus remains insufficiently concentrated. Most existing studies treat green credit policies as a subtopic within green finance, examining them alongside policies like green bonds and carbon finance. This approach yields conclusions lacking specificity and fails to provide in-depth analysis of green credit's independent mechanisms. Such a broad research perspective hinders accurate analysis of green credit policy effects, necessitating greater focus on its differentiated impacts. Second, measurement methods are relatively monolithic, lacking ex ante versus ex post comparative analysis. Most studies employ static indicators, failing to fully capture the dynamic effects of policies. Furthermore, existing research generally does not distinguish whether enterprises proactively fulfill environmental responsibilities ex ante or reactively comply ex post, making it difficult to discern whether green credit policies genuinely incentivize environmental responsibility or merely compel reactive compliance. Third, research on policy mechanisms is insufficient. The ultimate implementation of green credit policies relies on banks' lending decisions. However, existing literature predominantly analyzes the effects of green credit policies on corporate environmental responsibility fulfillment from the enterprise perspective, paying less attention to incentive mechanisms and constraints on the banking side. Research on specific mechanisms—such as green credit approval standards and preferential interest rates—and their impact on corporate environmental responsibility fulfillment remains insufficient.

3. Theoretical Analysis of the Impact and Mechanism of Green Credit Policies on Corporate Environmental Responsibility Implementation

3.1 Theoretical Analysis of Green Credit Policies' Impact on Corporate Environmental Responsibility Implementation

Green credit policies, as a crucial component of environmental economic instruments, exert a profound influence on corporate environmental responsibility fulfillment by guiding enterprises to proactively meet their environmental obligations through their impact on financial institutions' credit decision-making processes. From the perspective of policy implementation, analysis can be divided into two phases: pre-lending and post-lending.

During the pre-lending phase, banks primarily impose constraints on corporate environmental responsibility fulfillment through due diligence on fund usage and the establishment of environmental performance benchmarks. In accordance with the Green Credit Guidelines, banks must rigorously examine the intended use of funds before extending loans. This includes verifying that capital does not flow into projects restricted or phased out by national regulations, ensuring compliance with environmental requirements. Such scrutiny compels enterprises to integrate environmental factors into project planning from the outset, conducting environmental feasibility assessments to reduce compliance risks at the operational level. Simultaneously, financial institutions like banks set clear environmental performance indicators—such as carbon emission caps and resource utilization efficiency—as loan approval conditions. They implement differentiated pricing to increase financing costs for high-pollution enterprises (Marcel, 2010). This incentivizes companies to proactively optimize production processes or adjust business strategies, assuming environmental responsibility before project commencement. This elevates corporate environmental accountability while reducing the likelihood of "pollute first, treat later" practices.

During the post-lending phase, financial institutions primarily monitor corporate environmental responsibility fulfillment through three approaches: tracking fund usage, environmental information disclosure, and public oversight. Banks verify the actual flow of loan funds to ensure they are directed toward green and environmentally friendly projects. This monitoring of fund flows significantly reduces misappropriation rates, compelling enterprises to strictly adhere to their commitments and fulfill environmental responsibilities. Concurrently, environmental information disclosure systems serve as a crucial post-lending oversight measure. Policy mandates requiring regular environmental disclosures not only facilitate regulatory verification but also enhance transparency in corporate environmental practices. Companies opt to disclose environmental information to avoid reputational costs, thereby incentivizing them to address environmental issues and sustain environmental responsibility. Furthermore, this disclosure mechanism provides additional avenues for public oversight. Capital markets, environmental organizations, or media can monitor enterprises through disclosed data, generating public pressure that motivates companies to proactively fulfill environmental responsibilities to maintain market reputation (Wang et al., 2013), further strengthening post-loan constraints.

Financial institutions like banks exert differing influences on corporate environmental responsibility fulfillment through pre-loan and post-loan oversight. Green credit policies integrate environmental responsibility into initial corporate decision-making through pre-loan screening and post-loan supervision. This encourages enterprises to optimize environmental management measures, abandon high-pollution projects, and increase funding for green technologies, thereby reducing environmental burdens at the source. Moreover, rigorous pre- and post-loan management not only monitors fund usage to prevent fictitious environmental expenditures but also compels enterprises to regularly assess their environmental performance under post-loan oversight. This shifts their approach from passive pollution response to proactive enhancement of environmental governance capabilities and active post-event remediation, thereby fulfilling corporate environmental responsibilities.

Through pre- and post-loan management mechanisms, banks exert significant incentives on both preemptive and reactive environmental behaviors of enterprises. This stimulates the intrinsic motivation for enterprises to fulfill environmental responsibilities, ensures the sustained implementation of environmental measures, and significantly promotes the fulfillment of both preemptive and reactive environmental responsibilities.

In summary, this paper proposes:

Hypothesis 1: The implementation of green credit policies has a positive effect on the fulfillment of preemptive environmental responsibilities by enterprises.

Hypothesis 2: The implementation of green credit policies positively promotes the fulfillment of ex-post environmental responsibilities by enterprises.
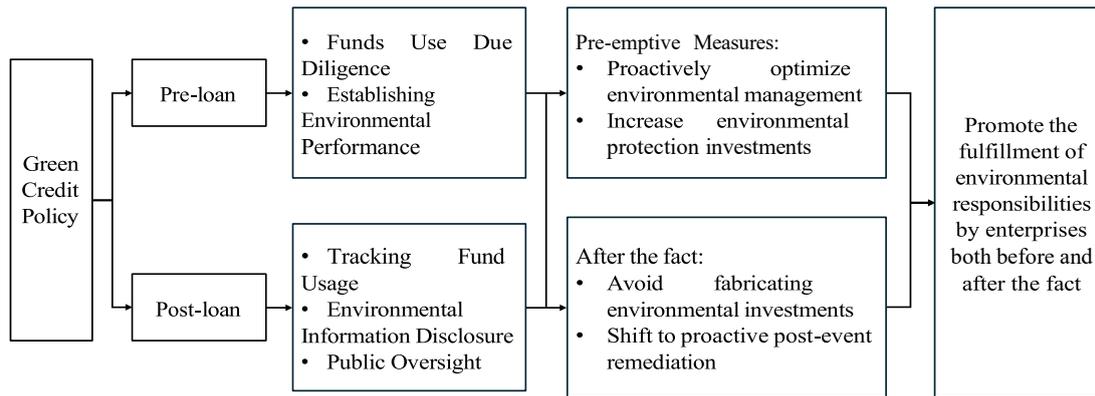
Figure 1. Theoretical Analysis of Green Credit Policies' Impact on Corporate Environmental Responsibility Implementation

3.2 Theoretical Analysis of the Mechanism by Which Green Credit Policies Influence Corporate Environmental Responsibility Implementation

Green credit policies guide capital flows toward environmentally friendly sectors through a mechanism combining incentives and constraints, curbing financing activities in high-pollution and energy-intensive industries. This approach promotes corporate environmental responsibility while significantly enhancing the quality of green credit supply from banks. As a key mechanism within green credit policies, the quality of green credit supply can be analyzed primarily from two dimensions: "quantity" and "price."

From a "quantity" perspective, the proportion of green credit assets has steadily increased, with the scale of bank green credit gradually expanding. This expansion sends a positive policy signal to enterprises: credit resources will be prioritized for projects and companies meeting environmental standards. Guided by green credit policies, banks have progressively reduced credit support for high-pollution, high-energy-consumption industries while increasing funding supply to green and environmentally friendly sectors. As green credit policies are progressively implemented and deepened, banks have strengthened their screening capabilities for enterprises with environmental potential. To prevent capital flows to companies with poor environmental performance, banks have established multidimensional environmental evaluation systems. These systems incorporate key indicators such as pollution emission levels into credit decision-making, thereby incentivizing enterprises to adopt green technologies and fulfill environmental responsibilities. Furthermore, since enterprises require project-based financing, banks have placed greater emphasis on the environmental viability of projects during credit allocation. This has sharpened their ability to identify green projects, thereby raising enterprises' environmental awareness and encouraging increased investment in green initiatives. Furthermore, financial institutions like banks have enhanced their monitoring capabilities over credit funds. They not only require that fund usage align with green environmental projects but also track capital flows to ensure loans are strictly deployed for green initiatives as agreed, preventing misappropriation or misuse. This enhanced capability standardizes fund usage, reinforces corporate emphasis on environmental responsibility, and drives proactive environmental stewardship.

From a pricing perspective, green credit policies significantly reduce financing costs for green projects by offering low-interest loans, easing constraints on enterprises. These policies prompt banks to implement differentiated pricing for green versus non-green projects, lowering financing barriers for green initiatives. This enables environmentally conscious enterprises to access more substantial funding, facilitating expanded environmental investments and proactive fulfillment of environmental responsibilities. Conversely, other enterprises proactively adjust their operational strategies to increase the application of green technologies and enhance environmental responsibility fulfillment in order to access financing incentives. Simultaneously, the establishment of dedicated financing channels by banks and other financial institutions further diversifies funding sources for green projects, accelerates credit approval processes, and optimizes the efficiency of financial resource allocation. The creation of dedicated financing channels by banks also promotes standardized credit criteria and regulated information disclosure. This enables more precise guidance for corporate loan approvals and interest rate pricing, reinforces external oversight mechanisms for environmental responsibility fulfillment, and enhances transparency in corporate environmental practices. By incorporating environmental performance as a key reference indicator, these channels significantly incentivize enterprises to proactively improve environmental conduct to secure more

favorable financing terms. This shifts corporate behavior from passive compliance to proactive emission reduction, elevating the level of environmental responsibility fulfillment.

Green credit policies enhance the quality of banks' green credit supply, simultaneously promoting preemptive and post-event environmental responsibility fulfillment from both quantitative and qualitative dimensions. Banks' rigorous screening mechanisms and differentiated financing terms compel enterprises to prioritize environmental benefits upfront by adopting clean technologies to reduce pollution. Furthermore, banks' strict oversight of fund usage and periodic environmental performance evaluations reinforce corporate environmental awareness in the post-event phase, compelling enterprises to implement green strategies and sustain environmental responsibility fulfillment.

In summary, this paper proposes:

Hypothesis 3: Green credit policies promote the fulfillment of pre- and post-event environmental responsibilities by enterprises through enhancing the quality of green credit supply by banks.
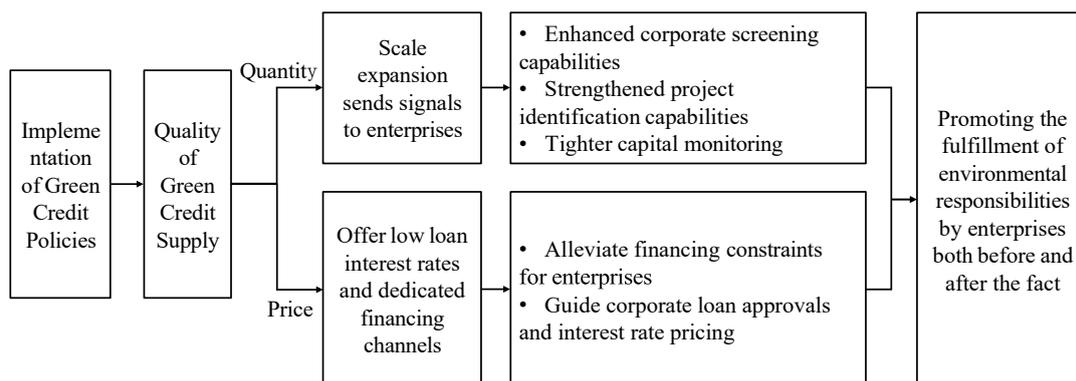

Figure 2. Theoretical Analysis of the Mechanism by Which Green Credit Policies Influence Corporate Environmental Responsibility Implementation

4. Empirical Analysis of Green Credit Policies' Impact on Corporate Environmental Responsibility Implementation

4.1 Data Sources

This study utilizes data from A-share listed companies between 2008 and 2020 as the original sample. The sample data underwent the following processing: (1) Exclusion of samples with partial data missing. (2) Exclusion of samples from the financial and insurance sectors. (3) Exclusion of ST and *ST samples. After these steps, a total of 34,095 samples were obtained. Green credit data policies were sourced from relevant policy documents on provincial and municipal government websites, covering the period from 2017 to 2020. All other data were obtained from company annual reports, the Wind database, and the Guotai An database.

4.2 Variable Settings

4.2.1 Dependent Variables: Pre-Treatment Environmental Responsibility Performance (FrontActWord), Post-Treatment Environmental Responsibility Performance (EndTreatWord)

This study adopts the methodology proposed by Li (2018), employing text analysis to conduct word frequency analysis on relevant statements in corporate annual reports. It examines the impact of green credit policies on corporate environmental responsibility fulfillment from two perspectives: preemptive environmental responsibility fulfillment (FrontActWord) and post-event environmental responsibility fulfillment (EndTreatWord).

4.2.2 Explanatory Variable: Green Loan Subsidy (CGLoanSubsidy)

The explanatory variable is green credit scale (CGLoanSubsidy). Following Guo and Fang (2021), this study employs text analysis methods to examine loan announcements and annual reports of listed companies, thereby determining whether the bank credit obtained by enterprises constitutes green credit.

4.2.3 Control Variables

To identify the impact of green credit policies on corporate environmental responsibility fulfillment, this study controls for the following relevant variables:

(1) Firm-level control variables

① Whether the firm is a state-owned enterprise (SOE). ② Size: Represented by the natural logarithm of total assets. ③ Debt-to-Asset Ratio (Lev): Represented by the ratio of total liabilities to total assets, measuring the firm's indebtedness level. ④ Return on Assets (ROA): Calculated as net profit divided by total assets, measuring the profitability of corporate assets. ⑤ Asset Turnover Ratio (ATO): Calculated as operating revenue divided by total assets, measuring the operational efficiency of corporate assets. ⑥ Cash Flow Ratio: Calculated as cash flow from operating activities divided by total assets, measuring the sufficiency of corporate cash flow. ⑦ Revenue Growth Rate (Growth): Calculated as the ratio of current-period operating revenue minus the previous-period operating revenue, reflecting a company's market expansion capacity and growth potential.

(2) City-Level Control Variables

① Per Capita Regional GDP (pGDP): Measured as the ratio of regional GDP to permanent resident population, indicating regional economic development levels. ② Total Urban Credit as a Percentage of Regional GDP (TC): Calculated as the ratio of total loans from financial institutions to regional GDP, reflecting the level of financial development and the extent of credit support for the economy. ③ Secondary Industry Output Value as a Percentage of Regional GDP (IS): Calculated as the ratio of secondary industry value-added to regional GDP, measuring the degree of regional industrialization.

4.3 Model Construction

To better analyze the impact of green credit policies on enterprises' fulfillment of environmental responsibilities both before and after policy implementation, this paper constructs a two-way fixed effects model based on data from A-share listed companies. The specific model is as follows:

$$FrontActWord_{it} = \alpha_0 + \alpha_1 CGLoanSubsidy_{it} + \alpha_2 \text{ CONTROLS} + \delta_i + \gamma_t + \varepsilon_{it} \tag{1}$$

$$EndTreatWord_{it} = \alpha_0 + \alpha_1 \text{ CGLoanSubsidy}_{it} + \alpha_2 \text{ CONTROLS} + \delta_i + \gamma_t + \varepsilon_{it} \tag{2}$$

Here, i denotes individual firms, t denotes year, and the dependent variable is measured by pre-treatment $FrontActWord_{it}$ and post-treatment $EndTreatWord_{it}$ environmental and social responsibility performance. CONTROLS represents the set of control variables mentioned above. α_0 denotes the model's intercept term, δ_i represents the individual fixed effect, γ_t indicates the year fixed effect, and ε_{it} signifies the model's disturbance term.

4.4 Benchmark Regression Results

4.4.1 Descriptive Analysis

Table 1 presents the descriptive statistics results for the selected variables in this study. The data indicate that the mean pre-event environmental responsibility fulfillment of enterprises is 5.5254, with a median of 1.0000 and a standard deviation of 15.6880. The median is lower than the mean, and the data exhibit right skewness. This suggests significant variation in pre-event environmental responsibility fulfillment levels across different enterprises, with most enterprises demonstrating relatively low fulfillment. Meanwhile, the mean for post-event environmental responsibility fulfillment is 1.2863, with a median of 0.0000 and a standard deviation of 1.8428. This indicates that only a small proportion of enterprises actively assume environmental responsibilities, while the majority demonstrate low levels of post-event environmental responsibility fulfillment, failing to significantly fulfill their environmental obligations. The mean value for green credit scale is 0.0514, indicating that only a small number of enterprises have received green credit support. The limited coverage of green credit policies reflects their selective nature toward green enterprises.

Table 1. Descriptive Statistics

VarName	Obs	Mean	Median	SD

FrontActWord	34095	5.5254	1.0000	15.6880
EndTreatword	34095	1.2863	0.0000	1.8428
CGLoanSubsidy	34095	0.0514	0.0000	0.2209
SOE	34095	0.4866	0.0000	0.4998
Size	34095	21.7688	21.6102	1.3892
Lev	34095	0.4450	0.4346	0.7115
ROA	34095	0.0400	0.0396	0.1027
ATO	34095	1.5632	1.0108	5.9283
Cashflow	34095	0.1708	0.1285	0.4072
Growth	34095	1.7389	0.1309	67.1269
pGDP	34095	10.9781	11.0657	1.2745
TC	34095	1.5057	1.4967	0.6580
IS	34095	42.9830	44.8000	10.9223

4.4.2 Parallel Trend Test

A parallel trend test was conducted on the sample data to verify whether the sample enterprises in the treatment group and control group exhibited identical change trends prior to the implementation of the green credit policy. As shown in Figure 3, the test uses the year of green credit policy implementation as the origin. Results indicate that both the treatment group and control group maintained identical trend lines prior to policy implementation. Following implementation, the divergence between the two groups widened. This demonstrates that the green credit policy promotes corporate environmental responsibility fulfillment both before and after implementation, confirming that the sample data satisfies parallel trend requirements.
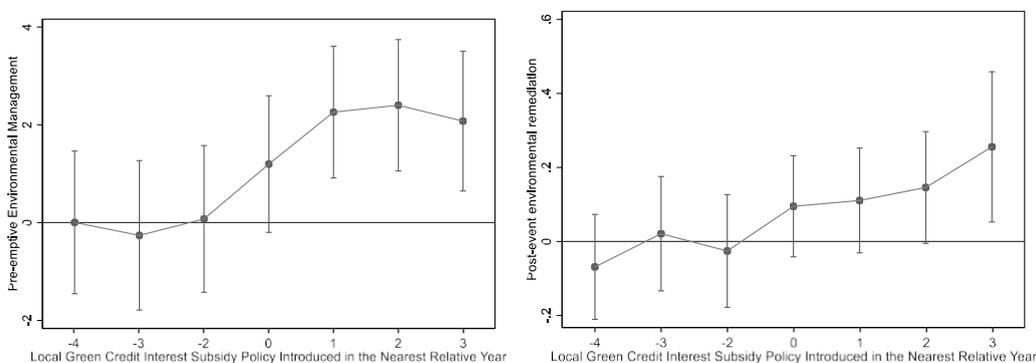

Figure 3. Parallel Trend Test for Environmental Governance Before and After

4.4.3 Benchmark Regression Results

As shown in Table 2, regardless of whether control variables are included, the regression coefficient for pre-treatment environmental responsibility fulfillment (FrontActWord) passed the 5% significance test, while the regression coefficient for post-treatment environmental responsibility fulfillment (EndTreatWord) passed the 1% significance test. Both coefficients were significantly positive, indicating that green credit policies help promote listed companies' fulfillment of their corporate environmental responsibilities. It can be observed that after the implementation of green credit policies, financial institutions' credit systems were influenced, driving enterprises to optimize environmental governance. This led to a significant improvement in both pre-treat and post-treat environmental responsibility levels, validating Hypothesis 1 and Hypothesis 2.

Simultaneously, firm size, debt-to-asset ratio, return on net assets, and cash-to-assets ratio all significantly positively influence both pre-treat and post-treat environmental responsibility fulfillment. This indicates that larger firms with stronger profitability and more abundant cash flow are more inclined to actively fulfill environmental responsibilities. A possible reason is that these firms possess more stable cash flows to support environmental investments and have greater resources to bear environmental costs, leading them to proactively adopt environmental measures and engage in environmental governance. Furthermore, highly leveraged firms prioritize post-event environmental performance to meet credit requirements and maintain financing channels. Conversely, both per capita regional GDP and the proportion of total urban credit to regional GDP exhibit significant negative correlations with both preemptive and reactive environmental responsibility fulfillment. This may stem from enterprises in more developed regions or those with greater financial resources prioritizing production investments amid intense market competition, thereby reducing environmental

expenditures. Alternatively, the dispersion of credit resources in economically advanced areas may diminish the incentive effect of green credit policies, leading to reduced levels of both preemptive and reactive environmental responsibility fulfillment.

Table 2. Benchmark Regression

	(1) FrontActWord	(2) FrontActWord	(3) FrontActWord	(4) EndTreatWord	(5) EndTreatWord	(6) EndTreatWord
CGLoanSubsidy	0.9893**	0.8767**	0.8449**	1.2345***	1.1195***	1.0862***
	(0.3480)	(0.3504)	(0.3562)	(0.3555)	(0.3539)	(0.3603)
SOE		-0.1633	-0.1783		-0.3735	-0.3828
		(0.4315)	(0.4405)		(0.4694)	(0.4769)
Size		1.2695***	1.2751***		1.1946***	1.2007***
		(0.1558)	(0.1568)		(0.1369)	(0.1376)
Lev		1.0393*	1.0305*		1.1862**	1.1768**
		(0.4926)	(0.4871)		(0.4531)	(0.4478)
ROA		7.0838***	7.0855***		6.5168***	6.5211***
		(1.2288)	(1.2352)		(1.1679)	(1.1755)
ATO		-0.0136	-0.0136		-0.0138	-0.0137
		(0.0098)	(0.0098)		(0.0100)	(0.0100)
Cashflow		1.6177**	1.6504**		1.1813*	1.2113*
		(0.6515)	(0.6516)		(0.5790)	(0.5779)
Growth		0.0004	0.0004		0.0005	0.0005
		(0.0008)	(0.0008)		(0.0008)	(0.0008)
pGDP			-0.0958***			-0.1182***
			(0.0186)			(0.0233)
TC			-0.4870***			-0.4349***
			(0.1605)			(0.1397)
IS			0.0229*			0.0210*
			(0.0119)			(0.0106)
_cons	6.4398***	-22.3092***	-21.5684***	5.3798***	-21.6034***	-20.6252***
	(0.0212)	(3.4787)	(3.7893)	(0.0216)	(3.0426)	(3.3036)
N	34095	34095	34095	34095	34095	34095

Adj. R2	0.7299	0.7316	0.7317	0.7310	0.7326	0.7327
F	8.0837	19.1955	38.9486	12.0611	24.6191	48.112 8

4.5 Robustness Test

To enhance the reliability of empirical findings, this study tests the robustness of benchmark regression results by substituting the dependent variables. Energy conservation (EnEV) serves as the substitute variable for preemptive environmental responsibility fulfillment, while pollutant emissions (PoEm) represent the substitute for reactive environmental responsibility fulfillment. The test results are presented in Table 3. The table indicates that the regression coefficient for green credit scale on energy conservation is significantly positive at the 1% level, while the coefficient on pollutant emissions is significantly negative at the 5% level. This confirms that even after substituting the dependent variables, green credit policies still exert a positive promotional effect on both pre- and post-event environmental responsibility fulfillment by enterprises. This aligns with the prior benchmark regression results, demonstrating the stability of the test outcomes.

Table 3. Robustness Tests

	(1) EnEV	(2) PoEm
CGLoanSubsidy	0.0201***	-0.0071**
	(0.0075)	(0.0035)
SOE	-0.0333	0.0117
	(0.0203)	(0.0095)
Size	0.0439***	0.0057***
	(0.0030)	(0.0014)
Lev	0.0050	-0.0024
	(0.0142)	(0.0067)
ROA	0.0414*	0.0106
	(0.0232)	(0.0109)
ATO	-0.0001	-0.0001
	(0.0003)	(0.0001)
Cashflow	0.0216	0.0117
	(0.0152)	(0.0071)
Growth	-0.0000	-0.0000
	(0.0000)	(0.0000)
pGDP	0.0014	0.0007
	(0.0015)	(0.0007)
TC	-0.0049	0.0070**
	(0.0062)	(0.0029)
IS	-0.0020***	0.0004*
	(0.0004)	(0.0002)
_cons	-0.7402***	-0.1257***
	(0.0699)	(0.0327)
N	34095	34095
Adj. R2	0.5131	0.6647
F	24.2994	3.0478

4.6 Heterogeneity Analysis

Based on ownership structure, enterprises can be categorized into state-owned and non-state-owned entities. To examine how different ownership types fulfill environmental responsibilities under green credit policies, this study divides all sample enterprises into state-owned and non-state-owned groups for separate regression analysis. Specific regression results are presented in Tables 4 and 5, where column (1) shows results for all enterprises, column (2) for state-owned enterprises, and column (3) for non-state-owned enterprises.

The results indicate that during the pre-policy phase, the scale of green credit positively impacts SOEs at the 1% significance level, while it positively affects NSOEs but not significantly. This may stem from SOEs typically receiving government guidance and maintaining closer ties with authorities, enabling them to respond swiftly to policy directives. Government guidance steers enterprises toward greener development, leveraging various green credit incentives to boost SOEs' investments in environmental protection. This facilitates enhanced pre-policy environmental responsibility fulfillment. Non-state-owned enterprises, however, face more intense market competition pressures. Compared to

increasing environmental investments, these enterprises may prioritize boosting production inputs to survive and thrive in fierce competition, making them less influenced by the scale of green credit.

Table 4 . Analysis of Heterogeneity in Pre-emptive Environmental Responsibility Implementation by Enterprises

	(1) FrontActWord	(2) FrontActWord	(3) FrontActWord
CGLoanSubsidy	0.8449***	1.9925***	0.3287
	(0.2758)	(0.5306)	(0.3049)
SOE	-0.1783	0.0000	0.0000
	(0.7374)	(0.0000)	(0.0000)
Size	1.2751***	1.4489***	1.3978***
	(0.1114)	(0.1946)	(0.1345)
Lev	1.0305**	-0.2680	3.4730***
	(0.5196)	(0.8978)	(0.6447)
ROA	7.0855***	9.9710***	5.6903***
	(0.8476)	(1.7073)	(0.9249)
ATO	-0.0136	-0.0078	-0.2053***
	(0.0092)	(0.0104)	(0.0534)
Cashflow	1.6504***	-2.3180**	2.2444***
	(0.5538)	(1.1407)	(0.6181)
Growth	0.0004	-0.0001	0.0047**
	(0.0008)	(0.0009)	(0.0020)
pGDP	-0.0958*	-0.0130	-0.0747
	(0.0556)	(0.1593)	(0.0552)
TC	-0.4870**	-0.7548**	-0.2593
	(0.2241)	(0.3302)	(0.3154)
IS	0.0229	0.0839***	-0.0349*
	(0.0159)	(0.0250)	(0.0206)
_cons	-21.5684***	-27.8990***	-22.8308***
	(2.6032)	(4.7389)	(3.0779)
N	34095	14483	19612
Adj. R2	0.7317	0.7079	0.7612
F	21.2329	13.5772	19.9664

For the post-event stage, the scale of green credit is positively correlated with SOEs at the 1% significance level and with NSOEs at the 10% significance level. This indicates that SOEs are more significantly impacted by green credit policies than NSOEs. A possible reason is that SOEs place greater emphasis on long-term planning and development. Guided by national policies, they consistently fulfill environmental responsibilities and increase investments in post-event pollution control. Non-state-owned enterprises, however, need to shoulder environmental responsibilities to address post-event pollution in order to establish a positive market image that attracts consumers and investments, as well as to resolve financing constraints. To some extent, they are also influenced by the scale of green credit.

Table 5. Analysis of Heterogeneity in Post-Event Environmental Responsibility Implementation by Enterprises

	(1) EndTreatWord	(2) EndTreatWord	(3) EndTreatWord
CGLoanSubsidy	1.0591***	2.2169***	0.4972*
	(0.2681)	(0.5117)	(0.2992)
SOE	-0.3866	0.0000	0.0000
	(0.7172)	(0.0000)	(0.0000)
Size	1.2051***	1.2675***	1.3653***
	(0.1084)	(0.1878)	(0.1320)
Lev	1.1945**	-0.2476	3.6679***
	(0.5053)	(0.8664)	(0.6327)
ROA	6.5263***	9.4627***	5.2075***
	(0.8243)	(1.6479)	(0.9076)
ATO	-0.0137	-0.0077	-0.2134***
	(0.0090)	(0.0100)	(0.0524)
Cashflow	1.2086**	-1.9842*	1.7804***
	(0.5385)	(1.1011)	(0.6066)
Growth	0.0005	-0.0001	0.0049**
	(0.0008)	(0.0009)	(0.0020)

pGDP	-0.1154**	-0.1001	-0.0896*
	(0.0540)	(0.1538)	(0.0541)
TC	-0.4313**	-0.7352**	-0.1249
	(0.2179)	(0.3187)	(0.3095)
IS	0.0219	0.0882***	-0.0398**
	(0.0154)	(0.0241)	(0.0202)
_cons	-20.8021***	-24.5071***	-22.7317***
	(2.5312)	(4.5732)	(3.0204)
N	34095	14486	19609
Adj. R2	0.7324	0.7064	0.7625
F	20.8474	13.1937	20.6147

5. Mechanism Analysis of Green Credit Policies' Impact on Corporate Environmental Responsibility Implementation

5.1 Mechanism Variable Setting: Green Credit Supply Quality (Loan_Asset)

The mechanism variable in this paper is defined as the quality of green credit supply, measured by the proportion of green credit (Loan_Asset). This is calculated as the ratio of green credit balances to total assets, quantifying the scale and extent of the transition toward green credit structures among financial institutions such as banks.

5.2 Model Construction

Numerous scholars have demonstrated that the quality of green credit supply positively influences corporate environmental responsibility fulfillment. Si and Cao (2022) argue that green credit policies increase credit allocation to green enterprises, thereby enhancing their environmental responsibility fulfillment. Liu and Qin (2023) indicate that the positive incentive mechanism of green credit policies for environmentally friendly enterprises can significantly boost corporate enthusiasm for assuming environmental and social responsibilities. Cui and Zhang (2024) contend that green credit policies effectively channel capital toward the green real economy, alleviating firms' financing constraints and enhancing their environmental responsibility. Drawing on Jiang's (2022) two-step approach, we construct a two-way fixed effects model examining the impact of green credit policies on the quality of green credit supply and validate its underlying mechanism.

$$\text{Loan Asset}_{it}=\alpha_0+\alpha_1\text{CGLoanSubsidy}_{it}+\alpha_2 \text{ CONTROLS}+\delta_i+\gamma_t+\varepsilon_{it} \tag{3}$$

Here, i denotes an individual firm, t represents the year, the dependent variable is the proportion of green loans in total assets (Loan_Asset), CONTROLS denotes the set of control variables mentioned above, α_0 represents the model's intercept term, δ_i denotes the individual fixed effect, γ_t denotes the year fixed effect, and ε_{it} denotes the model's error term.

To further validate the robustness of previous literature findings, this study also constructed a model examining the impact of green credit supply quality on firms' pre- and post-environmental responsibility fulfillment, thereby verifying the robustness of the results.

$$\text{FrontActWord}_{it}=\alpha_0+\alpha_1\text{Loan Assert}_{it}+\alpha_2 \text{ CONTROLS}+\delta_i+\gamma_t+\varepsilon_{it} \tag{4}$$

$$\text{EndTreatword}_{it}=\alpha_0+\alpha_1\text{Loan Assert}_{it}+\alpha_2\text{CONTROLS}+\delta_i+\gamma_t+\varepsilon_{it} \tag{5}$$

Here, i denotes individual firms, t denotes year, and the dependent variable is measured by environmental responsibility fulfillment in the pre-treatment FrontActWord_{it} and post-treatment EndTreatword_{it} conditions. CONTROLS represents the set of control variables mentioned above, α_0 denotes the model's intercept term, δ_i denotes the individual fixed effect, γ_t denotes the year fixed effect, and ε_{it} denotes the model's disturbance term.

5.3 Mechanism Verification

The regression results of the mechanism test are shown in Table 6.

Table 6. Mechanism Verification

(1)	(2)	(3)	(4)
Loan_Asset	Loan_Asset	FrontActWord	EndTreatWord

	(1)	(2)	(3)	(4)
CGLoanSubsidy	0.0177**	0.0166***		
	(0.0070)	(0.0064)		
Loan_Asset			5.8231***	5.6435***
			(1.3984)	(1.3900)
SOE		-0.0044	-0.1260	-0.3274
		(0.0066)	(1.5227)	(1.5316)
Size		0.0041**	1.2589***	1.1921***
		(0.0017)	(0.2635)	(0.2557)
Lev		0.0428***	0.7975	0.9756
		(0.0133)	(1.1899)	(1.1400)
ROA		0.0413***	6.8535***	6.3040***
		(0.0148)	(1.5441)	(1.5288)
ATO		-0.0000	-0.0133	-0.0134
		(0.0000)	(0.0154)	(0.0153)
Cashflow		0.0049	1.5956*	1.1473
		(0.0121)	(0.9103)	(0.8738)
Growth		-0.0000	0.0004	0.0005
		(0.0000)	(0.0008)	(0.0008)
pGDP		-0.0017***	-0.0896	-0.1107*
		(0.0005)	(0.0557)	(0.0573)
TC		0.0036	-0.4732	-0.4061
		(0.0046)	(0.5211)	(0.4680)
IS		-0.0002	0.0293	0.0299
		(0.0003)	(0.0522)	(0.0499)
_cons	0.0189***	-0.0664	-21.5465***	-20.9097***
	(0.0004)	(0.0433)	(5.7071)	(5.4713)
N	34095	34095	34095	34095
Adj. R2	0.2737	0.2751	0.7333	0.7339
F	6.3174	4.1501	6.8891	6.5070

Columns (1) to (2) examine the impact of green loan scale (CGLoanSubsidy) on the quality of green loan supply. The results indicate that the regression coefficient for green loan scale is significantly positive at both the 5% and 1% significance levels, suggesting that the implementation of green credit policies has significantly increased the proportion of green loans in the total loan portfolio of banks and other financial institutions. This may stem from green credit policies signaling clear policy direction, incentivizing banks and other financial institutions to reallocate more credit quotas toward green and environmentally friendly sectors, thereby increasing the proportion of green credit. Columns (3) and (4) respectively examine the impact of green credit supply quality on pre-treat environmental responsibility fulfillment (FrontActWord) and post-treat environmental responsibility fulfillment (EndTreatWord). It can be seen that the regression coefficients for the quality of green credit supply are both significantly positive at the 1% level. This indicates that an expansion in the proportion of green credit provided by banks may lead to more abundant funding for green enterprises, positively promoting both pre-treat and post-treat environmental responsibility fulfillment by enterprises. This validates the robustness of previous literature findings.

6.   Conclusions and Recommendations

Global environmental challenges are intensifying, and public awareness of environmental protection continues to grow. Against the backdrop of the "dual carbon" goals, green finance has garnered significant attention from both the state and society. As a core component of the green finance system, green credit policies direct credit resources toward environmentally friendly enterprises and projects, incentivize green technological innovation, and promote the fulfillment of corporate environmental responsibilities. This study examines how green credit policies influence corporate environmental responsibility fulfillment through the quality of green credit supply. Using data from A-share listed companies between 2008 and 2020, a two-way fixed effects model analyzes whether green credit policies positively promote corporate environmental and social responsibility. The study validates the robustness of these findings and investigates the heterogeneity of policy impacts across different types of enterprises. Key research conclusions include:

First, under the influence of green credit policies, both preemptive and reactive environmental responsibility fulfillment levels significantly increase. This encourages enterprises to proactively adopt environmental measures and make green investments beforehand, while addressing environmental pollution afterward. Furthermore, replacing the preemptive

environmental responsibility variable with "energy conservation" and the reactive responsibility variable with "pollutant emissions" yields robust regression results.

Second, the impact of green credit policies differs markedly between state-owned and non-state-owned enterprises. The policy exerts a more pronounced effect on state-owned enterprises, significantly enhancing their environmental responsibility fulfillment in both preemptive green investments and post-event pollution control. While non-state-owned enterprises also experience positive effects from green credit policies, these are relatively weaker, particularly in terms of preemptive environmental responsibility fulfillment.

Third, green credit policies enhance corporate environmental responsibility fulfillment by improving the quality of green credit supply from banks. By increasing the proportion of green credit and providing preferential interest rates alongside stricter reviews, these policies enable environmentally friendly enterprises to access more adequate funding. This, in turn, drives gradual strengthening of environmental responsibility fulfillment in both pre- and post-event phases.

The implementation of green credit policies plays a crucial role in improving environmental governance and promoting sustainable development. This policy not only allocates resources to green and environmentally friendly enterprises through differentiated credit measures, incentivizing increased green investments, but also imposes financing constraints on enterprises, compelling them to engage in environmental governance and effectively enhancing their environmental responsibility levels. Based on the above conclusions, this paper proposes the following recommendations:

First, governments and regulatory bodies should continue refining the green credit policy framework to strengthen its guidance on corporate environmental responsibility. This includes specifying green credit standards and establishing dynamic environmental performance evaluation mechanisms to enhance policy transparency. Enterprises should actively respond by increasing R&D investment in green technologies, adopting eco-conscious decision-making, and fulfilling environmental obligations.

Second, the government should implement differentiated guidance and incentive measures for state-owned and non-state-owned enterprises. For state-owned enterprises, institutional frameworks for environmental responsibility should be strengthened, with preferential policies incentivizing deeper investments in both preventive measures and post-incident remediation. For non-state-owned enterprises, more flexible policies—including tax and fee reductions, technology subsidies, and other measures—should be adopted to lower environmental compliance costs. This will encourage green innovation and enhance the proactive fulfillment of environmental responsibilities among non-state-owned enterprises.

Third, the government should continuously optimize the implementation mechanisms for green credit to enhance the quality of green credit supply. Efforts should be strengthened to build the supply side of green credit. Regulatory bodies should adopt more scientific credit pricing standards and improve pre-loan review and post-loan supervision processes to ensure credit funds are directed toward green projects. Concurrently, green finance capacity building for financial institutions, including small and medium-sized banks, should be reinforced to promote the effective implementation of green credit policies across a broader scope.

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